

1 **Amendment to the Claims**

2 **In the Claims:**

3 Please cancel Claims 25 and 26.

4 Please amend Claims 1-3, 8-10, 16-18, and 27, and add new Claims 29-43 as follows:

5 1. (Currently Amended) A method for identifying a specific cell, to enable a determination  
6 to be made as to whether the specific cell corresponds to a known cell type, comprising the steps of:  
7 providing spatial frequency content data from a side scatter image of the known cell type;  
8 directing incident light at [[a]] the specific cell, using a detector to obtain [[a]] the side scatter  
9 image of the specific cell; and  
10 using-comparing the spatial frequency content of the side scatter image to identify a of the  
11 specific cell to the spatial frequency content data of the side scatter image of the known cell type to  
12 determine if the specific cell corresponds to the known cell type.

13 2. (Currently Amended) The method of claim 1 wherein there is relative motion between the  
14 specific cell and the detector.

15 3. (Currently Amended) The method of claim 1 wherein [[a]] the specific cell subpopulation  
16 [[is]] identified with is contained within a heterogeneous cell population, and side scatter image data  
17 is collected for the heterogeneous cell population.

18 4. (Original) The method of claim 1 wherein the specific cell identified is an apoptotic cell.

19 5. (Original) The method of claim 4 wherein the apoptotic cell is an early stage apoptotic cell  
20 or a late stage apoptotic cell.

21 6. (Original) The method of claim 1 wherein the specific cell identified is a necrotic cell.

22 7. (Original) The method of claim 1 wherein the specific cell identified is at least one of an  
23 apoptotic cell and a necrotic cell.

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1           8. (Currently Amended) A method for identifying a specific cell, to enable a determination  
2 to be made as to whether the specific cell corresponds to a known cell type comprising the steps of:  
3 providing spatial frequency content data from a brightfield image of the known cell type;  
4 directing incident light at ~~[[a]]~~ the specific cell, using a detector to obtain ~~[[a]]~~ the brightfield  
5 image of the specific cell; and  
6 ~~using-comparing~~ the spatial frequency content of the brightfield image ~~to identify a~~ of the  
7 specific cell to the spatial frequency content data of the brightfield image of the known cell type to  
8 determine if the specific cell corresponds to the known cell type.

9           9. (Currently Amended) The method of claim 8 wherein there is relative motion between the  
10 specific cell and the detector.

11           10. (Currently Amended) The method of claim 8 wherein ~~[[a]]~~ the specific cell  
12 ~~subpopulation~~ [[is]] identified with is contained within a heterogeneous cell population, and  
13 brightfield image data is collected for the heterogeneous cell population.

14           11. (Original) The method of claim 8 wherein the specific cell identified is an apoptotic cell.

15           12. (Original) The method of claim 11 wherein the apoptotic cell is an early stage apoptotic  
16 cell or a late stage apoptotic cell.

17           13. (Original) The method of claim 8 wherein the specific cell identified is a necrotic cell.

18           14. (Original) The method of claim 8 wherein the specific cell identified is at least one of an  
19 apoptotic cell and a necrotic cell.

20           15. (Original) The method of claim 8 wherein the spatial frequency content is of the nucleus.

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1           16. (Currently Amended) A method for identifying a specific cell, to enable a determination  
2 to be made as to whether the specific cell corresponds to a known cell type comprising the steps of:  
3           providing an image of the known cell type that has been marked with a nuclear marker;  
4           providing spatial frequency content data from the image of the known cell type that has been  
5 marked with the nuclear marker;

6           contacting ~~[[a]]~~ the specific cell with ~~[[a]]~~ the nuclear marker~~[[,]]~~;  
7           directing incident light at the marked specific cell~~[[,]]~~;  
8           using a detector to obtain an image of the marked specific cell~~[[,]]~~; and  
9           ~~using the nuclear marker~~ comparing the image of the marked specific cell and in combination  
10 with the a spatial frequency content of the [[cell]] image of the marked specific cell to identify a to  
11 the marked image of the known cell and the spatial frequency content of the marked image of the  
12 known cell type to determine if the specific cell corresponds to the known cell type.

13           17. (Currently Amended) The method of claim 16 wherein there is relative motion between  
14 the specific cell and the detector.

15           18. (Currently Amended) The method of claim 16 wherein ~~[[a]]~~ the specific cell  
16 ~~subpopulation~~ ~~[[is]]~~ identified with is contained within a heterogeneous cell population, and image  
17 data is collected for the heterogeneous cell population.

18           19. (Original) The method of claim 16 wherein the specific cell identified is an apoptotic  
19 cell.

20           20. (Original) The method of claim 19 wherein the apoptotic cell is an early stage apoptotic  
21 cell or a late stage apoptotic cell.

22           21. (Original) The method of claim 16 wherein the specific cell identified is a necrotic cell.

23           22. (Original) The method of claim 16 wherein the specific cell identified is at least one of  
24 an apoptotic cell and a necrotic cell.

25           23. (Original) The method of claim 16 wherein a single nuclear marker is used.

26           24. (Original) The method of claim 16 wherein the single nuclear marker is 7-  
27 aminoactinomycin D.

28           25. (Cancelled)

29           26. (Cancelled)

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1           27. (Currently Amended) A kit for use in a multispectral imaging system to identify a  
2 specific cell, comprising a single nuclear marker, wherein a cell is contacted with the single nuclear  
3 marker for a time sufficient to allow identification of an apoptotic cell or a necrotic cell with the  
4 multispectral imaging system using only a single nuclear marker.

5           28. (Original) The kit of claim 27 wherein the single nuclear marker is 7-aminoactinomycin  
6 D.

7           29. (New) A method for determining a viability status of a specific cell, comprising the steps  
8 of:

9                   exposing the specific cell to a nuclear marker that will bind to DNA in a nucleus of the  
10 cell;

11                   collecting a darkfield image of the specific cell;

12                   collecting a brightfield image of the specific cell;

13                   collecting a fluorescent image of the specific cell in which the nuclear marker is  
14 present; and

15                   analyzing the fluorescent image and at least one of the brightfield image and the  
16 darkfield image to determine the viability status of the specific cell, wherein the viability status  
17 corresponds to one of the following:

18                           a first status indicating that the specific cell is a viable cell;

19                           a second status indicating that the specific cell is in a relatively early stage of  
20 apoptosis;

21                           a third status indicating that the specific cell is in relatively late stage of  
22 apoptosis; and

23                           a fourth status indicating that the specific cell is a necrotic cell.

24           30. (New) The method of claim 29 wherein the first status is characterized by a relatively  
25 larger cellular area as determined from the brightfield image and no nuclear marker being present in  
26 the cell nucleus as determined by the fluorescent image.

27           31. (New) The method of claim 29 wherein the first status is characterized by a relatively  
28 lower scatter peak intensity as determined from the darkfield image and no nuclear marker being  
29 present in the cell nucleus as determined by the fluorescent image.

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1           32. (New) The method of claim 29 wherein the first status is characterized by a relatively  
2 larger cellular area as determined from the brightfield image, a relatively lower scatter peak intensity  
3 as determined from the darkfield image, and no nuclear marker being present in the cell nucleus as  
4 determined by the fluorescent image.

5           33. (New) The method of claim 29 wherein the second status is characterized by a relatively  
6 smaller cellular area as determined from the brightfield image and no nuclear marker being present in  
7 the cell nucleus as determined by the fluorescent image.

8           34. (New) The method of claim 29 wherein the second status is characterized by a relatively  
9 higher scatter peak intensity as determined from the darkfield image and no nuclear marker being  
10 present in the cell nucleus as determined by the fluorescent image.

11           35. (New) The method of claim 29 wherein the second status is characterized by a relatively  
12 smaller cellular area as determined from the brightfield image, a relatively higher scatter peak  
13 intensity as determined from the darkfield image, and no nuclear marker being present in the cell  
14 nucleus as determined by the fluorescent image.

15           36. (New) The method of claim 29 wherein the third status is characterized by a relatively  
16 smaller cellular area as determined from the brightfield image and the nuclear marker being present  
17 in the cell nucleus as determined by the fluorescent image.

18           37. (New) The method of claim 29 wherein the third status is characterized by a relatively  
19 higher scatter peak intensity as determined from the darkfield image and the nuclear marker being  
20 present in the cell nucleus as determined by the fluorescent image.

21           38. (New) The method of claim 29 wherein the third status is characterized by a relatively  
22 smaller cellular area as determined from the brightfield image, a relatively higher scatter peak  
23 intensity as determined from the darkfield image, and the nuclear marker being present in the cell  
24 nucleus as determined by the fluorescent image.

25           39. (New) The method of claim 29 wherein the fourth status is characterized by a relatively  
26 larger cellular area as determined from the brightfield image and the nuclear marker being present in  
27 the cell nucleus as determined by the fluorescent image.

28           40. (New) The method of claim 29 wherein the fourth status is characterized by a relatively  
29 lower scatter peak intensity as determined from the darkfield image and the nuclear marker being  
30 present in the cell nucleus as determined by the fluorescent image.

1           41. (New) The method of claim 29 wherein the fourth status is characterized by a relatively  
2 larger cellular area as determined from the brightfield image, a relatively lower scatter peak intensity  
3 as determined from the darkfield image, and the nuclear marker being present in the cell nucleus as  
4 determined by the fluorescent image.

5           42. (New) The method of claim 29 wherein the step of analyzing the brightfield image  
6 comprises the step of determining if blebbing is present, blebbing being indicative of the second  
7 status and the third status, while lack of blebbing being indicative of the first status and fourth status.

8           43. (New) The method of claim 42 wherein the step of analyzing the fluorescent image  
9 comprises the step of determining if the nuclear marker is present in the cellular nucleus, such that:

10                 when no blebbing is determined to be present by analyzing the brightfield image, and  
11 no nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent  
12 image, it can be concluded that the viability status of the cell corresponds to the first status indicating  
13 that the specific cell is viable;

14                 when blebbing is determined to be present by analyzing the brightfield image, and no  
15 nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image,  
16 it can be concluded that the viability status of the cell corresponds to the second status indicating that  
17 the specific cell is in a relatively early stage of apoptosis;

18                 when blebbing is determined to be present by analyzing the brightfield image, and the  
19 nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image,  
20 it can be concluded that the viability status of the cell corresponds to the third status indicating that  
21 the specific cell is in a relatively late stage of apoptosis; and

22                 when no blebbing is determined to be present by analyzing the brightfield image, and  
23 the nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent  
24 image, it can be concluded that the viability status of the cell corresponds to the fourth status  
25 indicating that the specific cell is necrotic.